

REMARKS/ARGUMENT

Claims 4-28 and 34-37, objected to as being dependent upon a rejected claim, but allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and/or overcome the rejections(s) under 35 U.S.C. 112, 2nd paragraph, have been so amended. Accordingly, Claims 4-28 and 34-37 stand allowable.

1) Claims 1-3 and 29 stand rejected under 35 U.S.C. 102(e) as being anticipated by Li et al. US 2004/0022174 A1. Applicants respectfully traverse this rejection, as set forth below.

In order that the rejection of Claims 1-3 and 29 be sustainable, it is fundamental that "each and every element as set forth in the claim be found, either expressly or inherently described, in a single prior art reference." *Verdegall Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). See also, *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989), where the court states, "The identical invention must be shown in as complete detail as is contained in the ... claim".

Furthermore, "all words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Independent Claim 1, as amended, requires and positively recites, a preamble for a wireless communications system, the preamble comprising a sequence wherein the sequence comprises a concatenation of a first set of sub-sequences, **with each sub-**

sequence containing more than one zero, and wherein each sub-sequence can differ depending upon its position in the preamble.

In contrast, Li specifically teaches that each long training sub-sequence contains ONLY ONE zero at DC (see page 1, column 2, line 1; Eq. 1). Accordingly, Li fails to teach or suggest, “a sequence wherein the sequence comprises a concatenation of a first set of sub-sequences, **with each sub-sequence containing more than one zero**”, as required by Claim 1. Accordingly, the 35 U.S.C. 102(e) rejection is improper and must be withdrawn.

Claims 2, 3 and 29 stand allowable as depending (directly or indirectly) from allowable Claim 1 and including further limitations not taught or suggested by the reference of record.

Claim 2 further defines the preamble of claim 1, wherein the sub-sequences are specified in the time domain. Claim 2 depends from Claim 1 and stands allowable for the same reasons set forth above in support of the allowability of Claim 1.

Claim 3 further defines the preamble of claim 1 further comprising a second sequence wherein the second sequence comprises a concatenation of a second set of sub-sequences, wherein the second set of sub-sequences differ from the first set of sub-sequences. Claim 3 depends from Claim 1 and stands allowable for the same reasons set forth above in support of the allowability of Claim 1.

Claim 29 further defines the preamble of claim 1, wherein the wireless communications system uses orthogonal frequency division multiple access. Claim 29 depends from Claim 1 and stands allowable for the same reasons set forth above in support of the allowability of Claim 1.

2) Claims 30-34 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. US 2004/0022174 A1 (Li) in view of Kaku et al. US 2003/0007190 A1. Applicants respectfully traverse this rejection, as set forth below.

Claim 30 further defines the preamble of claim 29, wherein the wireless communications system is a time-frequency interleaved, orthogonal frequency division multiple access communications system. Examiner admits that Li fails to teach or suggest a time frequency interleaved, OFDM system. Examiner, however, relies upon Kaku for this teaching. But even if, *arguendo*, Kaku teaches an OFDM system wherein the transmitter of the system further performs time frequency interleaving and suggests this results in a two-dimensional interleaving, as suggested by Examiner, Kaku fails to teach or suggest the previously described deficiency of Li in respect to Claim 1. Accordingly, no *prima facie* case of obviousness has been established. The 35 U.S.C. 103(a) rejection is overcome.

Claim 31 further defines the preamble of claim 1, wherein the preamble can be transformed prior to transmission. Examiner admits that Li fails to teach or suggest wherein the signal including the preamble is transformed prior to transmission. Examiner, however, relies upon Kaku for this teaching. But even if, *arguendo*, Kaku teaches an OFDM system wherein the signal in the transmitter is transformed (from element 4 through element 8 in Fig. 12 transforming to time domain, removing or filtering of zero point and interleaving), as suggested by Examiner, Kaku fails to teach or suggest the previously described deficiency of Li in respect to Claim 1. Accordingly, no *prima facie* case of obviousness has been established. The 35 U.S.C. 103(a) rejection is overcome.

Claim 32 further defines the preamble of claim 31, wherein the transformation comprises a time-domain filtering. Examiner admits that Li fails to teach or suggest time-domain filtering. Examiner, however, relies upon Kaku for this teaching. But even if, *arguendo*, Kaku teaches time-domain filtering (5 in Fig. 12, removing or filtering of zero point in time domain, as it receives output of IFFT), as suggested by Examiner, Kaku fails to teach or suggest the previously described deficiency of Li in respect to Claim 1. Accordingly, no *prima facie* case of obviousness has been established. The 35 U.S.C. 103(a) rejection is overcome.

Claim 33 further defines the preamble of claim 31, wherein the transformation comprises: “a first domain conversion”, “processing the domain converted preamble” and “a second domain conversion”. Examiner admits that Li fails to teach or suggest the above limitations. Examiner, however, relies upon Kaku for this teaching. But even if, *arguendo*, Kaku teaches the transformation comprising a first domain conversion (element 4 in Fig. 12), processing the domain converted preamble (Li in view of Kaku teaches the signal comprises the preamble, processing the signal in elements 5-7) and a second domain conversion (element 8), as suggested by Examiner, Kaku fails to teach or suggest the previously described deficiency of Li in respect to Claim 1. Accordingly, no *prima facie* case of obviousness has been established. The 35 U.S.C. 103(a) rejection is overcome.

Independent Claim 34, as amended, requires and positively recites, a preamble for a wireless communications system, the preamble comprising: “a sequence wherein the sequence comprises a concatenation of a first set of sub-sequences, with each sub-sequence containing a specified number of zeroes”, “wherein the preamble can be transformed prior to transmission and wherein each sub-sequence can differ depending upon its position in the preamble, wherein the transformation comprises: a first domain conversion; processing the domain converted preamble; and a second domain conversion,

wherein the processing comprises magnitude clipping, and wherein the time domain sequence after the second domain conversion is specified as follows:

Sequence Element	Value	Sequence Element	Value	Sequence Element	Value	Sequence Element	Value
C ₀	0.6564	C ₃₂	-0.0844	C ₆₄	-0.2095	C ₉₆	0.4232
C ₁	-1.3671	C ₃₃	1.1974	C ₆₅	1.1640	C ₉₇	-1.2684
C ₂	-0.9958	C ₃₄	1.2261	C ₆₆	1.2334	C ₉₈	-1.8151
C ₃	-1.3981	C ₃₅	1.4401	C ₆₇	1.5338	C ₉₉	-1.4829
C ₄	0.8481	C ₃₆	-0.5988	C ₆₈	-0.8844	C ₁₀₀	1.0302
C ₅	1.0892	C ₃₇	-0.4675	C ₆₉	-0.3857	C ₁₀₁	0.9419
C ₆	-0.8621	C ₃₈	0.8520	C ₇₀	0.7730	C ₁₀₂	-1.1472
C ₇	1.1512	C ₃₉	-0.8922	C ₇₁	-0.9754	C ₁₀₃	1.4858
C ₈	0.9602	C ₄₀	-0.5603	C ₇₂	-0.2315	C ₁₀₄	-0.6794
C ₉	-1.3581	C ₄₁	1.1886	C ₇₃	0.5579	C ₁₀₅	0.9573
C ₁₀	-0.8354	C ₄₂	1.1128	C ₇₄	0.4035	C ₁₀₆	1.0807
C ₁₁	-1.3249	C ₄₃	1.0833	C ₇₅	0.4248	C ₁₀₇	1.1445
C ₁₂	1.0964	C ₄₄	-0.9073	C ₇₆	-0.3359	C ₁₀₈	-1.2312
C ₁₃	1.3334	C ₄₅	-1.6227	C ₇₇	-0.9914	C ₁₀₉	-0.6643
C ₁₄	-0.7378	C ₄₆	1.0013	C ₇₈	0.5975	C ₁₁₀	0.3836
C ₁₅	1.3565	C ₄₇	-1.6067	C ₇₉	-0.8408	C ₁₁₁	-1.1482
C ₁₆	0.9361	C ₄₈	0.3360	C ₈₀	0.3587	C ₁₁₂	-0.0353
C ₁₇	-0.8212	C ₄₉	-1.3136	C ₈₁	-0.9604	C ₁₁₃	-0.6747
C ₁₈	-0.2662	C ₅₀	-1.4448	C ₈₂	-1.0002	C ₁₁₄	-1.1653
C ₁₉	-0.6866	C ₅₁	-1.7238	C ₈₃	-1.1636	C ₁₁₅	-0.8896
C ₂₀	0.8437	C ₅₂	1.0287	C ₈₄	0.9590	C ₁₁₆	0.2414
C ₂₁	1.1237	C ₅₃	0.6100	C ₈₅	0.7137	C ₁₁₇	0.1160
C ₂₂	-0.3265	C ₅₄	-0.9237	C ₈₆	-0.6776	C ₁₁₈	-0.6987
C ₂₃	1.0511	C ₅₅	1.2618	C ₈₇	0.9824	C ₁₁₉	0.4781
C ₂₄	0.7927	C ₅₆	0.5974	C ₈₈	-0.5454	C ₁₂₀	0.1821
C ₂₅	-0.3363	C ₅₇	-1.0976	C ₈₉	1.1022	C ₁₂₁	-1.0672
C ₂₆	-0.1342	C ₅₈	-0.9776	C ₉₀	1.6485	C ₁₂₂	-0.9676
C ₂₇	-0.1546	C ₅₉	-0.9982	C ₉₁	1.3307	C ₁₂₃	-1.2321
C ₂₈	0.6955	C ₆₀	0.8967	C ₉₂	-1.2852	C ₁₂₄	0.5003
C ₂₉	1.0608	C ₆₁	1.7640	C ₉₃	-1.2659	C ₁₂₅	0.7419
C ₃₀	-0.1600	C ₆₂	-1.0211	C ₉₄	0.9435	C ₁₂₆	-0.8934
C ₃₁	0.9442	C ₆₃	1.6913	C ₉₅	-1.6809	C ₁₂₇	0.8391

Applicants respectfully point out that Examiner must consider ALL of the words & limitations of Claim 34. Nowhere does Examiner address "... and wherein the time domain sequence after the second domain conversion is specified as follows (i.e., the values illustrated and required in the remaining portion of the claim). Accordingly, no

prima facie case of obviousness has been established. The 35 U.S.C. 103(a) rejection is improper and must be withdrawn.

In proceedings before the Patent and Trademark Office, "the Examiner bears the burden of establishing a prima facie case of obviousness based upon the prior art". In re Fritch, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992) (citing In re Piasecki, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). "The Examiner can satisfy this burden **only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references**", In re Fritch, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992)(citing In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988)(citing In re Lalu, 747 F.2d 703, 705, 223 USPQ 1257, 1258 (Fed. Cir. 1988)).

Although couched in terms of combining teachings found in the prior art, the same inquiry must be carried out in the context of a purported obvious "modification" of the prior art. **The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification.** In re Gordon, 733 F.2d at 902, 221 USPQ at 1127. Moreover, it is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. In re Gorman, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed.Cir.1991). See also Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1138, 227 USPQ 543, 547 (Fed.Cir.1985).

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable

expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitation, with the other elements of the respective independent claims, with the other elements of the respective independent claim. (MPEP § 2143).

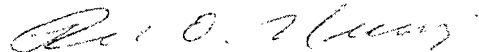
Moreover, obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill *in the art*. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Lee*, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to the motivation to combine references); *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

Applicants respectfully point out that Examiner has provided no evidence that Kaku teaches or suggests the previously described deficiencies of Li as applied to Claim 1, the claim upon which Claims 30-34 ultimately depend. Applicants further point out that any subsequent determination by Examiner that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish *a prima facie case of* obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). See also *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000) (Court reversed obviousness

rejection involving technologically simple concept because there was no finding as to the principle or specific understanding within the knowledge of a skilled artisan that would have motivated the skilled artisan to make the claimed invention); *Al-Site Corp. v. VSIInt'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999) (The level of skill in the art cannot be relied upon to provide the suggestion to combine references). Accordingly, the 35 U.S.C. 103(a) rejection of Claims 30-34 is improper and must be withdrawn.

Claims 4-28 and 34-37, objected to as being dependent upon a rejected claim, but allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and/or overcome the rejections(s) under 35 U.S.C. 112, 2nd paragraph, have been so amended. Accordingly, Claims 4-28 and 34-37 stand allowable. Claims 1-3, 29 and 30-34 stand allowable for the reasons set forth above. Applicants respectfully request withdrawal of the remaining rejections and allowance of the application at the earliest possible date.

Respectfully submitted,



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